

1 45386/DMC/V165

WHAT IS CLAIMED IS:

- 5 1. A crosspoint switch unit comprising:  
a switch matrix module comprising:  
a first element including a semiconductor  
substrate with a plurality of active elements; and  
a second element coupled to the first element and  
10 including a first set of transmission lines and a second set of  
transmission lines, the second set of transmission lines being  
orthogonal to the first set of transmission lines; and  
a crosspoint switch comprising:  
a plurality of programmable registers coupled  
15 to the plurality of active elements;  
wherein each active element of the plurality  
of active elements is coupled one transmission line of the first  
set of transmission lines and one transmission line of the second  
set of transmission lines through a tap.
- 20 2. The crosspoint switch unit of claim 1 wherein the tap is a  
via-hole.
3. The crosspoint switch unit of claim 1 further comprising a  
secondary substrate coupled to the second element.
- 25 4. The crosspoint switch unit of claim 1 wherein the switch  
matrix module includes inputs coupled to the first set of  
transmission lines and outputs coupled to the second set of  
transmission lines.
- 30 5. The crosspoint switch unit of claim 4 wherein the inputs and  
outputs are coupled to pads of a printed circuit board via a ball  
grid array.

35

1 45386/DMC/V165

6. The crosspoint switch unit of claim 4 further comprising a second switch matrix module including inputs and outputs, the inputs of the second switch matrix module being coupled to the outputs of the switch matrix module.

7. The crosspoint switch unit of claim 1 further comprising a passive network coupled to a plurality of transmission lines of the first set of transmission lines.

8. The crosspoint switch unit of claim 7 wherein the passive network includes capacitors and resistors tuned to compensate for signal degradation prior to the first set of transmission lines.

9. The crosspoint switch unit of claim 7 wherein the passive network includes a resistor and a capacitor in parallel on each of lines of a differential signal with a register coupling the lines.

10. The crosspoint switch unit of claim 7 wherein the network is external with respect to the switch matrix module.

11. The crosspoint switch unit of claim 7 wherein the network is embedded in the same die of integrated circuit as the switch matrix module.

12. The crosspoint switch unit of claim 7 wherein the network provides decreased signal attenuation at higher frequencies.

13. The crosspoint switch unit of claim 1 wherein the crosspoint switch further comprises:

a programming interface coupled to the switch core; and  
output drive level registers setting output drive levels of outputs of the switch matrix, as commanded by the programming interface.

1 45386/DMC/V165

14. The crosspoint switch unit of claim 1 wherein the crosspoint switch further comprises:

5 a programming interface coupled to the switch core; and  
output drive level registers coupled to the outputs of the switch core and controlling output levels of outputs of the switch core.

10 15. The crosspoint switch unit of claim 14 further comprising:

a primary access port coupled to the programming interface and providing instructions to the programming interface; and

15 a secondary access port coupled to the programming interface and utilized while the primary access port is in use.

16. The crosspoint switch unit of claim 14 further comprising:

user registers coupled to the switch matrix module and storing programming data provided by the programming interface;

20 wherein the programming data includes mapping information regarding interconnections of inputs to outputs of the switch matrix module, as specified by a user.

17. The crosspoint switch unit of claim 14 further comprising:

25 staging registers coupled to the switch core;  
wherein the programming interface stores programming data previously stored in the staging registers and provides the programming data to the staging registers at a later time.

30 18. The crosspoint switch unit of claim 14 wherein the programming interface is configured to provide programming data that associates consecutive outputs to inputs as specified by the programming interface.

35

1 45386/DMC/V165

19. The crosspoint switch unit of claim 14 wherein the programming interface is configured to group inputs and outputs of the switch matrix module.

5

20. The crosspoint switch unit of claim 17 wherein the programming interface associates the groups of the inputs to the groups of the outputs.

10

21. The crosspoint switch unit of claim 18 wherein the inputs and outputs are grouped based on numerical ordering of the inputs and outputs.

15

22. The crosspoint switch unit of claim 19 wherein the inputs and outputs are grouped based on placement of inputs and outputs with respect to the switch core.

20

25

30

35